Development of a Calibration Methodology for Code-compliant Simulation of a Case Study House in a Hot and Humid Climate

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ABSTRACT

This paper describes a comparison of the results between a code-compliant DOE-2 simulation and monthly utility bills for a case study house in College Station, Texas. The comparison of the results is a preliminary step toward the development of an automatic calibration methodology. In this study, simulated electricity and natural gas use of the case study house were obtained from a code-compliant DOE-2 simulation using house characteristics from the case study house and TMY2 weather data. Next, the Normalized Annual Consumption (NAC) was calculated from the simulated results using the ASHRAE Inverse Modeling Toolkit (IMT). Then, the NAC was also calculated for the monthly utility bills of the case study house, and the NAC results from simulation and monthly utility bills were compared. The DOE-2 simulation was then adjusted by changing the input variables. Several statistical verification methods are described, matching a goodness-of-fit indicator, percent difference calculation, Mean Bias Error (MBE), and the Coefficient of Variation of the Root Mean Squared Error (CV-RMSE) to evaluate the adequacy of the simulation calibrations.

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